

TRANSMISSIONS FROM THE SINGING PLANET

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I recently began blogging for Thinking Animals, Inc., an organization affiliated with the Hunter College Animal Behavior & Conservation program that organizes public lectures on animal intelligence by respected scientists in our field. The blog will be available online with an update to Thinking Animals' current website, to occur within the next several weeks. This article discusses a lecture entitled "Communication: What can animals tell us?" that was held on Nov. 16, 2012.

Take a moment to think about the ways you communicate every day. Maybe you called your friend up for a chat on the phone. Maybe you kissed your partner on the cheek as you left for work. Maybe you scolded your child, or shook a new acquaintance's hand. You left a meager tip at the bar—or an extravagant one. You wrote a line of poetry. Maybe you heard someone cry.

I think, therefore I am—but *we* communicate, therefore *we* are. Our society stands on the foundation of what is spoken, heard, written, read, shouted and intimated. But we are not the only species that live by communication. This was the topic of our discussion on the night of November 16th, when Drs. Katy Payne and Chris Clark spoke with us about their fields. Both are members of the Bioacoustics Research Program within the Cornell Lab of Ornithology, and spend their lives listening to the voices of animals.



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“Everywhere you go, from dawn to dusk and from pole to pole, everywhere you go on this planet, whether it’s a tiny tree-hopper or a hundred-ton blue whale, you will hear the world singing,” said Dr. Clark. For both scientists, a fascination with animal communication began by listening to that song. In 1968, on a trip to Bermuda, a Navy engineer played Katy Payne some of the first recordings of humpback whales calling. They were sounds that Navy hydrophones had picked up purely incidentally. To open the evening’s lecture, Dr. Payne played us a segment of those recordings. For many minutes, the lecture hall filled with the slow, ghostly rhythm of whale song. The echoes rolling across our ears were evocative of the abyssal ocean, lulling us into meditation. Slowly, a pattern emerges. Singsong, plodding riffs repeat, then change slightly, then are replaced by a different phrase altogether.

“If we listened through for awhile, the pattern would eventually get right back to the beginning,” said Dr. Payne with a smile as the recording concluded. She played us another segment of song that was sped up, making the bass of the humpback’s call sound like a falsetto bird song, and revealing clear themes, repetitions, and even rhymes in the whale’s song.

As Dr. Payne did more investigation on these intriguing songs, she discovered more about them. By reviewing songs over many years, she and her team realized that the songs were composed of many distinct themes, and that these themes changed slowly over time. They also found that at any given time, all whales in a given population sang the same song. By making these small, agreed-upon changes through the seasons, after a few years a song would be completely different, its themes all shifted about and changed. It seemed as if over time new adaptations would be introduced, become popular—fashionable, perhaps—and pervade the repertoire of the entire community. It is perhaps the most well-studied example of cultural transmission in non-humans that we have found.

Dr. Payne and Dr. Clark treated us to one acoustic treat after another throughout the night. The structured songs of the humpback whales; the long, low moans of blue whales; the odd tapping of fin whales (“Like an elf in the back room banging on a table,” said Dr. Clark); the playful high cacophony of melon-headed whales; the precise buzz of a beaked whale’s sonar as it plied the depths, seeking out squid. All of these sounds—transmissions from the singing planet—are communication. We technological humans have it easy; when we want to talk to someone a thousand miles away, we pick up a telephone. The bassists of the sea, however—the great whales—have evolved a different method for transcontinental communication. Simply put, they yell at the top of their lungs, and at the bottom of their voices. Sound travels five times faster in water than in air, Dr. Clark told us, and much farther. And if you’re a big whale, calling in the powerful infrasonic range, your voice will travel farther still. “A few weeks ago, using that same Navy system where Katy first heard the humpbacks,” said Dr. Clark, “I listened to a blue whale singing off the West coast of Ireland, and I heard the voice of that whale, 1,500 miles away, off of Bermuda.” Blue whales make use of huge swaths of ocean as their regular stomping grounds, all along calling to conspecifics who may be oceans away.

This is communication on a different scale than we primates know to expect. Working with humpback whale songs may therefore have prepared Katy Payne for her next discovery. While observing elephants at the Portland Zoo, Dr. Payne felt the air around her throbbing.

Following a hunch, she recorded the elephants, and sped up the track several times. A low moaning call that had been infrasonically inaudible to human ears was revealed. Here was the answer to how herds of elephants many miles apart on the savannah were coordinating their motions—not ESP, as other researchers had proposed in their perplexity, but low, durable calls broadcast long distances. “It was called an instantaneous discovery,” said Payne, “and it gave me the opportunity to go to Africa for the next ten years.”

There, Dr. Payne and other members of the Elephant Listening Project document the calls of elusive forest elephants in the Congo. They have recorded female elephants chorusing to dominant males, families screaming as they rescue infants in danger, and the growling yells of hundreds of elephants in procession as they stroke and prod the body of a dead calf for hours. The singing planet has many voices.

It is difficult to understand the acoustic spaces that these animals occupy. Dr. Clark has become more and more concerned with the sonic imposition we force upon the inhabitants of our oceans. We are extraordinarily unaware. “There are no known deaf vertebrates in the ocean,” he said. “If you want to survive, you listen. If you want to communicate, you make sounds.” Cetaceans and other marine creatures hear, rather than see, their way through their lives—and the deafening cacophony of ships, and explosive seismic testing, and a million other human screeches, are drowning out these acoustic lives. Whales stop calling when the ambient noise is too loud. They are going silent more and more of the time. “We are tearing apart the social fabric of these populations,” said Dr. Clark. This may impair the whales’ ability to tell each other where the best food sources are. For millennia, over thousands of miles of dark water, the great whales have sung information and contact to each other. Now, in our modern din, the largest creatures on Earth may find themselves truly alone.

Dr. Clark has been using information on the sonic footprints of ships and seismic testing to show scientific advisory boards just how catastrophic this noise pollution is to marine life. Doing his work—acting as a witness and ambassador for the singing planet—is more than enough reward.

“You gain a sense of the majesty and magnificence of life,” said Dr. Clark of this work. “It puts you in your place. You feel minute—you’re not even a grain of sand in the hourglass of life, but you are connected to the universe at the same time. And I don’t know about you guys, but when I feel that—as if I’m standing on an ice floe, at 49 degrees below zero, in the middle of the Arctic, and the only sensory system that works on me is my ears, because it’s so cold and I’m bundled up, and everything’s grey—that connectedness, where I could be dead in an instant, but I feel more alive than I’ve ever felt in my life—that’s what I get from doing what we do.”